Progress Report on Tsunami Detection Buoy Project

As of March 1, 1997, the following tasks have been completed or are in progress on the tsunami detection buoy project:

1. Designed a board based on the Motorola 68332 microprocessor that will be used in the new bottom pressure recorder (BPR) and the surface package. This board has been fully checked out and some software has been written.
2. Designed a PCMCIA board and interface electronics that will be the mass storage unit for the new Version D BPR. This BPR will be the heart of the Real-time System and will be an upgrade for the existing BPRs. The board uses a 40 MB Intel flash memory personal computer (PC) card, which will replace the hard disc drives used in the Version C BPR.
3. The counter board for the PAROS sensor has been redesigned to operate with very low power for long-term deployments. It is in the wire wrap stage of checkout and will be going to printed circuit board layout next week.
4. A Geostationery Operational Environmental Satellite (GOES) transmitter has been purchased and software was written on a PC to fully exercise it on self-timed and random reporting. Antenna and buoy tests have been underway, and the random return is 100% with a latency of report through the National Environmental Satellite, Data, and Information Service (NESDIS) dial-up modem of less than 1 minute.
5. A prototype Web page is under construction. It will take data from the GOES dial-up modem and display it in near real-time in a simulation mode for demonstration and evaluation.
6. A test of the acoustic modems will begin during the week of March 10, 1997, in Puget Sound, followed by a test from the R/V MOANA WAVE in Hawaii during March 24-25. This test will quantify the signal to noise levels received and the effect of sea state and transducer depth.
7. Titanium pressure sensor housings have been built, using Inconel tubing for long life.
8. Tentative deployments are planned for the R/V WECOMA cruise from Alaska in July, with a deployment of one buoy off Alaska and the other at OWS PAPA (or further south and east).
9. Buoy and mooring options are being studied. The high latitude locations demand a rigorous static, dynamic, and fatigue analysis. The effort now is hoped to keep the reliability high and the cost of future moorings down.
10. A Global Positioning System (GPS) receiver has been purchased and tested for integration into the buoy. This will provide the accurate time for the GOES transmission scheduling and buoy position. (An ARGOS position only system will be used as a back-

up.)

(NOTE: The Alaska Tsunami Warning Center (ATWC) and the Pacific Tsunami Warning Center (PTWC) presently have a GOES down-link)

In summary, things are on a good track, but we will soon be pushing the procurement system pretty hard on some major items. Many other bits and pieces are coming together and a very concerted effort is underway. Our goal to deploy two systems this year is quite demanding.

Budget for FY97 includes:

I. Engineering development: Subtotal $350K	
Electronic subsystem design for bottom moored instruments and buoy mounted hardware.	12 months
Software for imbedded processors in Bottom Pressure Recorders (BPR) acoustic modems, surface systems, including protocol development.	16 months
High latitude mooring design with static, dynamic, and fatigue life considerations.	8 months
Detection algorithm development and testing	6 months
Communications with GOES telemetry and ground based distribution.	12 months
II. Hardware/supplies (for 2 systems): Subtotal $350K	
Sensors, printed circuit boards, modems, transmitters, batteries, connectors, cables, etc.	$ 150K
Buoys, line, hardware, anchors, acoustic releases, glass balls, floats, handling gear, lights, antennas	$ 200K
III. Contracts/software/shop	$ 30K
IV. Shipping/travel/deployments	$ 50K
Total	**$ 780K**